Novel Microsensor for Measuring Oxygen, Water and Carbon Dioxide in the Spacecraft, Phase I

Completed Technology Project (2009 - 2009)

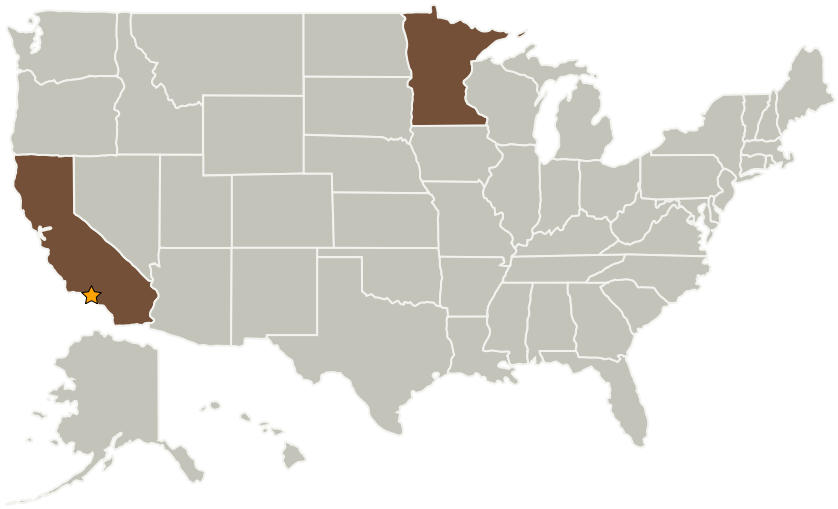
Project Introduction

A microsensor cell with interdigitated micron-size three electrode structure cell of thin film platinum sensing and counter electrodes and platinum pseudo or silver quasi reference electrodes deposited on silicon dioxide over silicon will be fabricated. A unique thin film composite polymer membrane electrolyte with high ionic conductivity and wide voltage window and hydrophobic property will be prepared and characterized and coated on the electrodes of the cell. The prototype sensor will be assembled in a suitable container covered with thin film PTFE membrane and feasibility demonstrated for sensing oxygen, water vapor and carbon dioxide.

Anticipated Benefits

Long life and low cost sensors with multi-gas/vapor sensing capability have potential application for detecting toxic vapors at the Department of Energy Hazard Waste Sites and EPA applications for toxic gases. These sensors have the potential for use in monitoring toxic and polluting gases such as SO2, NOx and CO2 at power plants and industrial boilers using fossil fuels. They find use detecting CO and volatile organic compounds(VOCs)for Indoor Air Quality monitoring homes and buildings.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
H.V. Setty Enterprises, Inc.	Supporting Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Burnsville, Minnesota

Primary U.S. Work Locations	
California	Minnesota

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Celestino Jun Rosca

Principal Investigator:

H.v. Venkatasetty

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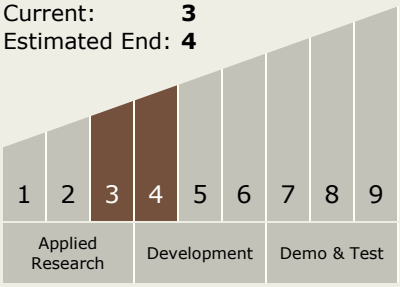
Technology Maturity (TRL)

Start: **3**
Current: **3**
Estimated End: **4**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.2 Electrochemical: Fuel Cells